

WHAT IS CLAIMED IS:

- [C001] 1. A stator component for a turbine assembly, comprising:
- a) an annular base component having an inner surface that is substantially circular in axial cross-section; and
  - b) a coating disposed on said inner surface of said base component, wherein said coating has an interfacial surface in contact with said inner surface of said base component and an outer surface opposite said interfacial surface, and wherein said coating has a thickness that varies as a function of circumferential position along said inner surface of said base component.
- [C002] 2. The stator component of claim 1, wherein said outer surface of said coating is substantially an ellipse in axial cross-section.
- [C003] 3. The stator component of claim 2, wherein said ellipse has a major axis running between top and bottom portions of said base component.
- [C004] 4. The stator component of claim 1, wherein said thickness of said coating is up to about 3mm.
- [C005] 5. The stator component of claim 4, wherein said thickness of said coating is up to about 1.75 mm.
- [C006] 6. The stator component of claim 1, wherein said coating comprises an abradable material.
- [C007] 7. The stator component of claim 6, wherein said abradable material comprises a metal matrix phase and at least one secondary phase.
- [C008] 8. The stator component of claim 7, wherein said metal matrix phase comprises at least one alloy selected from the group consisting of CoNiCrAlY, NiCrFeAl, and NiCrAl.

[C009] 9. The stator component of claim 7, wherein said secondary phase comprises graphite.

[C010] 10. The stator component of claim 7, wherein said at least one secondary phase comprises at least one of a ceramic, a polymer, and a salt.

[C011] 11. The stator component of claim 10 wherein said ceramic comprises at least one of hexagonal BN, aluminosilicates, and calcined bentonite clay.

[C012] 12. The stator component of claim 10 wherein said polymer comprises at least one of polyester, polyimide, polymethyl methacrylate, silicone, siloxane, and rubber.

[C013] 13. The stator component of claim 10 wherein said salt comprises at least one of aluminum phosphate and aluminum hydroxide.

[C014] 14. The stator component of claim 1, wherein said coating comprises a sprayed coating.

[C015] 15. The stator component of claim 9, wherein said thermally-sprayed coating process comprises at least one of a thermal-sprayed coating, a plasma-sprayed coating, a flame-sprayed coating, an HVOF-sprayed coating, and a wire-arc sprayed coating.

[C016] 16. The stator component of claim 1, wherein said base component comprises at least one of a shroud, a turbine casing, and an annular assembly of turbine nozzles.

[C017] 17. The stator component of claim 1, wherein said turbine assembly comprises a steam turbine.

[C018] 18. A stator component for a turbine assembly, comprising:

a) an annular base component having an inner surface that is substantially circular in axial cross-section; and

b) a coating comprising an abradable material, said coating disposed on said inner surface of said base component and having an interfacial surface in contact with said inner surface of said base component and an outer surface opposite said interfacial surface, wherein said outer surface of said coating is substantially an ellipse in axial cross-section having a major axis running between top and bottom portions of said base component.

[C019] 19. A method for making a stator component for a turbine assembly, comprising:

a) providing an annular base component having an inner surface that is substantially circular in axial cross-section; and

b) disposing a coating on said inner surface of said base component, wherein said coating has an interfacial surface in contact with said inner surface of said base component and an outer surface opposite said interfacial surface, and wherein said coating has a thickness that varies as a function of circumferential position along said inner surface of said base component.

[C020] 20. The method of claim 19, wherein said outer surface of said coating is substantially an ellipse in axial cross-section.

[C021] 21. The method of claim 20, wherein said ellipse has a major axis running between top and bottom portions of said base component.

[C022] 22. The method of claim 19, wherein disposing said coating further comprises disposing a coating comprising an abradable material.

[C023] 23. The method of claim 22, wherein said abradable material comprises a metal matrix phase and at least one secondary phase.

[C024] 24. The method of claim 23, wherein said metal matrix phase comprises at least one alloy selected from the group consisting of CoNiCrAlY, NiCrFeAl, and NiCrAl.

[C025] 25. The method of claim 23, wherein said secondary phase comprises graphite.

[C026] 26. The method of claim 23, wherein said at least one secondary phase comprises at least one of a ceramic, a polymer, and a salt.

[C027] 27. The method of claim 26 wherein said ceramic comprises at least one of hexagonal BN, aluminosilicates, and calcined bentonite clay.

[C028] 28. The method of claim 26 wherein said polymer comprises at least one of polyester, polyimide, polymethyl methacrylate, silicone, siloxane, and rubber.

[C029] 29. The method of claim 26 wherein said salt comprises at least one of aluminum phosphate and aluminum hydroxide

[C030] 30. The method of claim 19, wherein disposing comprises disposing said coating using a spray process.

[C031] 31. The method of claim 30, wherein said spray process comprises at least one of thermal-spray coating, plasma-sprayed coating, flame-sprayed coating, HVOF-sprayed coating, and wire-arc sprayed coating.

[C032] 32. The method of claim 19, wherein providing said base component comprises providing a base component comprising at least one of a shroud, a turbine casing, and an annular assembly of turbine nozzles.

[C033] 33. A method for making a stator component for a turbine assembly, comprising:

- a) providing an annular base component having an inner surface that is substantially circular in axial cross-section; and
- b) disposing, by a thermal spray process, a coating comprising abradable material, said coating disposed on said inner surface of said base component and having an interfacial surface in contact with said inner surface of said base component and an outer surface opposite said interfacial surface, wherein said outer surface of said coating is substantially an ellipse in axial cross-section having a major axis running between top and bottom portions of said base component